



S1 Fig. Signal to noise (SNR) comparison test was performed. Single shot gradient echo planar (GE-EPI) images obtained with $400 \times 400 \mu\text{m}$ in-plane spatial resolution with a temporal resolution of 1s in rat brain with 2mm thickness. Data was collected using surface coil (**A**) and quadrature coil (**B**). The SNR is ubiquitously high in cortical and subcortical regions using a quadrature coil as compared to surface coil. **C** and **D** shows the pictures of custom-built surface coil and the quadrature coil